VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI - 590018

Mini Project Report

On

"CARTOONIFYING, MORPHING AND BLENDING OF AN IMAGE"

A report submitted in partial fulfillment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

ABDUL AZEEZ	**4AL21CG001**
ALEX TAYENJAM	**4AL21CG005**
MOHAMMED SAAD	**4AL21CG037**
MADHUSUDHAN RAO K S	**4AL22CG400**

Under the Guidance of

Dr. Pushparani M K

Senior Assistant Professor

ALVA'S

Education Foundation

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY MIJAR,

(Unit of Alva's Education Foundation ®, Moodbidri)

Affiliated to Visvesvaraya Technological University, Belagavi,

Approved by AICTE, New Delhi, Recognized by the Government of Karnataka.

Accredited by NACC with A+ Grade

Shobavana Campus, Mijar, Moodbidri, D.K., Karnataka 2023-2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY MIJAR, MOODBIDRI, D.K. -574225

ALVA'S
Education Foundation

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the Computer Graphics and Image Processing Laboratory with Mini Project entitled **"CARTOONIFYING, MORPHING AND BLENDING OF AN IMAGE"** has been completed by

ABDUL AZEEZ	4AL21CG001
ALEX TAYENJAM	4AL21CG005
MOHAMMED SAAD	4AL21CG037
MADHUSUDHAN RAO K S	4AL22CG400

The Bonafide students of the Department of Computer Science and Design, Alva's Institute of Engineering and Technology in the **DEPARTMENT OFCOMPUTER SCIENCE AND DESIGN** of the VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini Project report has been approved as it satisfies the academic requirements concerning the Mini Project workof Computer Graphics and Image Processingsubject prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

Prof. Jayanthkumar A Rathod
HOD, Dept of CSD

EXTERNAL VIVA

Name of the Examiners	Signature with Date
1. Sunitha NV	8/8/24
2. J. A. Rathod	8/8/24

ABSTRACT

The project "Cartoonifying, morphing and blending of an image" explores techniques in computer graphics and image processing to transform and combine images in novel ways. The primary objectives of this project include cartoonifying an input image to produce a stylized, cartoon-like representation, blending two images to create a visually blended result, and morphing between two images to generate intermediate images that smoothly transition between the originals.

The methodologies employed in achieving these objectives leverage various image processing techniques. Edge detection is utilized to extract and emphasize edges in images, essential for creating cartoon-like effects. Color quantization reduces the number of distinct colors in an image, contributing to the simplified and stylized appearance characteristic of cartoons. Blending techniques combine two images based on a specified alpha value, allowing for adjustable degrees of transparency between them. Morphing involves generating a sequence of images that smoothly transition between two given images, achieved through linear interpolation of pixel values.

The implementation is realized using Python and OpenCV libraries, facilitating efficient image manipulation and visualization. The graphical user interface (GUI) component enables users to select images interactively and observe the results of different transformations in real-time. The project's outcomes are demonstrated through visualizations that showcase the original images, processed outputs, and intermediate steps involved in each transformation.

In conclusion, this project highlights the application of fundamental image processing techniques to achieve creative and visually compelling results in the context of digital image manipulation. The methodologies and insights gained contribute to a deeper understanding of computer graphics and image processing principles, with potential applications in fields ranging from entertainment to digital art and beyond.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI - 590018

Mini Project Report

On

"AUTOMATIC VEHICLE LICENCE DETECTION USING HAAR CASCADE CLASSIFIER"

A report submitted in partial fulfillment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

ADARSH BHAVIMANE	**4AL21CG004**
GHRUTHAVARSHA	**4AL21CG024**
RACHANA	**4AL21CG043**
RAKSHITHA	**4AL21CG045**

Under the Guidance of

Dr. Pushparani M K

Senior Assistant Professor

ALVA'S

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY MIJAR,

(Unit of Alva's Education Foundation ®, Moodbidri)

Affiliated to Visvesvaraya Technological University, Belagavi,

Approved by AICTE, New Delhi, Recognized by the Government of Karnataka.

Accredited by NACC with A+ Grade

Shobavana Campus, Mijar, Moodbidri, D.K., Karnataka 2023-2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY MIJAR, MOODBIDRI, D.K. -574225

ALVA'S
Education Foundation

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the Computer Graphics and Image Processing Laboratory with Mini Project entitled **"AUTOMATIC VEHICLE LICENCE DETECTION USING HAAR CASCADE CLASSIFIER"** has been completed by

ADARSH BHAVIMANE	4AL21CG004
GHRUTHAVARSHA	4AL21CG024
RACHANA	4AL21CG043
RAKSHITHA	4AL21CG045

The Bonafide students of the Department of Computer Science and Design, Alva's Institute of Engineering and Technology in the **DEPARTMENT OFCOMPUTER SCIENCE AND DESIGN** of the VISVESVARAYA TECHNOLOGICAL UNIVERSITY,BELAGAVI during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini Project report has been approved as it satisfies the academic requirements concerning the Mini Project work of Computer Graphics and Image Processingsubject prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

External Faculty

Prof. Jayantkumar A Rathod
HOD, Dept of CSD

Internal
J.A.Rathod

External
Savitha NV 7/8/24

ABSTRACT

The rapid advancements in computer vision and optical character recognition (OCR) technologies have significantly impacted the transportation and security industries. This project aims to develop an automated vehicle licence plate recognition system to address the inefficiencies and inaccuracies of manual data recording methods. Utilizing OpenCV for image and video processing and Tesseract OCR for text recognition, the system ensures high accuracy and reliability in real-time applications.

The system captures video frames from pre-recorded files or live webcam feeds and processes them using a Haar Cascade Classifier trained specifically for licence plate detection. Detected licence plate regions are extracted and preprocessed for OCR, where the Tesseract engine accurately reads the text. This automated process supports applications such as traffic monitoring, automated toll collection, and vehicle tracking, significantly reducing the need for manual intervention and minimizing errors.

The system's real-time processing capability ensures efficient operation in dynamic environments, making it suitable for various practical scenarios. This project demonstrates the effective integration of advanced computer vision and OCR technologies to create a robust licence plate recognition system. The results highlight significant improvements inoperational efficiency and accuracy. Future enhancements will focus on improving adaptability to different licence plate formats and integrating the system with broader surveillance and traffic management infrastructures, contributing to smarter and safer urban environments.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI-590018

Mini Project Report On

"Real Time Emotion Detection using TESS and a Pre-Trained AI Model"

A report submitted in partial fulfillment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

ANUSHA NT	4AL21CG006
JAHNAVI V	4AL21CG029
JAYAPRAKASH P	4AL21CG030
VIMALKUMAR U R	4AL21CG061

Under the Guidance of

Dr. Pushparani M K

Senior Assistant Professor

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MOODBIDRI-574225, KARNATAKA

2023 – 2024

Commenced From

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR, MOODBIDRI, D.K. -574225

ALVA'S
Education Foundation

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the CGIP Mini Project entitled **"REAL TIME EMOTION DETECTION USING TESS AND A PRE-TRAINED AI MODEL"** has been successfully completed by

ANUSHA N T	4AL21CG006
JAHNAVI V	4AL21CG029
JAYAPRAKASH P	4AL21CG030
VIMALKUMAR U R	4AL21CG061

the bonafide students of **Department of Computer Science & Design, Alva's Institute of Engineering and Technology** in **DEPARTMENT OF COMPUTER SCIENCE & DESIGN** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini project report has been approved as it satisfies the academic requirements in respect of Mini Project work prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

Mr. Jayanth Kumar A. Rathod
HOD/CSD

EXTERNAL VIVA

Name of the Examiners	Signature with Date
1. Sunitha NV	7/8/24
2. J. A. Rathod	

ABSTRACT

Emotion detection has become a crucial element in enhancing human-computer interaction by enabling technology to respond intuitively and empathetically to users' emotional states. This project focuses on real-time emotion detection using facial expressions, leveraging the Toronto Emotional Speech Set (TESS) and a pre-trained deep learning model. The system captures live video from a webcam, detects faces using OpenCV's Haar Cascade Classifier, and preprocesses the detected faces for emotion prediction. The pre-trained model analyzes the facial data, predicts the emotions, and displays them on the video feed while storing recent predictions in a buffer for smoother transitions. User interactions are enriched through text-to-speech capabilities, providing verbal responses based on detected emotions. Future enhancements include improving model accuracy with larger datasets, incorporating multi-modal inputs for comprehensive emotion detection, developing context-aware responses, and creating a mobile application to extend usability. These advancements aim to apply the system in real-world scenarios such as customer service, mental health monitoring, and educational tools, revolutionizing human-computer interactions with more empathetic and responsive technology.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

A MINI PROJECT REPORT ON

"REAL-TIME FACE RECOGNITION ATTENDANCE MONITORING SYSTEM"

IN

COMPUTER SCIENCE AND DESIGN

By

ASHISH BHUTKURI	4AL21CG007
VIKRAM	4AL21CG060
NARESH MAIBAM	4AL21CG039
LAKSHMISHA K A	4AL21CG034

Under the Guidance of

Dr. Pushparani M K

ALVA'S Education Foundation

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA' S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MOODBIDRI-574225, KARNATAKA

2023 – 2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR, MOODBIDRI, D.K. -574225

ALVA'S
Education Foundation

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the DBMS Mini Project entitled **"REAL-TIME FACE RECOGNITION ATTENDANCE MONITORING SYSTEM"** has been successfully completed by

ASHISH BHUTKURI	4AL21CG007
VIKRAM	4AL21CG060
NARESH MAIBAM	4AL21CG039
LAKSHMISHA K A	4AL21CG034

The bonafide students of the **Department of Computer Science & Design, Alva's Institute of Engineering and Technology** in the **DEPARTMENT OF COMPUTER SCIENCE & DESIGN** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in thedepartmental library. The Mini Project report has been approved as it satisfies the academic requirements in respect of Mini Project work prescribed for the Bachelor of Engineering Degree.**

Dr. Pushparani M K
Mini Project Guide

Mr. JayanthKumar A. Rathod
HOD CSD

EXTERNAL VIVA

Name of the Examiners	Signature with Date
1. Sunitha NV	8/8/24
2. J. A. Rathod	

ABSTRACT

This project presents a real-time face Recognition Attendance Monitoring System, leveraging Python and Machine Learning techniques to enhance efficiency and accuracy in attendance management. The core of the system employs the K-Nearest Neighbors (KNN) algorithm for face recognition due to its simplicity and effectiveness in classification tasks. The system functions by capturing live video feeds or accessing pre-recorded footage to detect and recognize faces in real time. Each identified face is cross-referenced with a pre-existing database to automatically mark attendance, eliminating the need for traditional roll calls or manual data entry. This automated process not only saves time but also reduces the likelihood of errors, ensuring a more reliable attendance tracking mechanism. In addition to recording attendance, the system stores the data in a CSV file, providing a permanent and easily accessible record for future reference. The integration with Streamlit allows for the dynamic display of attendance records, offering a user-friendly and interactive interface for users to monitor and manage attendance data. Furthermore, the system is designed to be scalable, capable of handling a large number of users, and includes security measures to protect sensitive information. This ensures that the attendance records are accessible only to authorized personnel, maintaining the privacy and integrity of the data. Overall, this smart attendance system aims to revolutionize attendance management in educational institutions and workplaces, promoting a seamless, efficient, and accurate process through the innovative use of technology.

Overall, this smart attendance system aims to streamline the attendance process in educational institutions and workplaces, promoting efficiency, accuracy, and ease of use. The combination of Python, KNN, and Streamlit not only ensures robust face recognition capabilities but also offers an interactive platform for real-time attendance tracking and management.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

A CG&IP-LAB MINI PROJECT REPORT ON

"Volume Controller by Hand Gesture Using OpenCV"

IN

COMPUTER SCIENCE AND DESIGN

By

ASHWIN K S	4AL21CG008
B PRAKASH	4AL21CG009
BALAJI SK	4AL21CG010
BHARAT	4AL21CG011

Under the Guidance of

Dr. Pushparani MK

Senior Assistant Professor

Dept. of Computer Science and Design

ALVA'S

Education Foundation

DEPARTMENT OF COMPUTER SCIENCE & DESIGN

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MOODBIDRI-574225, KARNATAKA

2023 – 2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR, MOODBIDRI, D.K. -574225

ALVA'S

DEPARTMENT OF COMPUTER SCIENCE & DESIGN

CERTIFICATE

This is to certify that the CG&FIP Mini Project entitled **"VOLUME CONTROLLER BY HAND GESTURE USING OPENCV"** has been successfully completed by

ASHWIN K S	4AL21CG008
B PRAKASH	4AL21CG009
BALAJI SK	4AL21CG010
BHARAT	4AL21CG011

the bonafide students of Department of Computer Science & Design, Alva's Institute of Engineering and Technology in **DEPARTMENT OF COMPUTER SCIENCE & DESIGN** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY,BELAGAVI** during the year 2024–2025. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini project report has been approved as it satisfies the academic requirements in respect of Mini Project work prescribed for the Bachelor of Engineering Degree.

Dr.Pushparani MK
Mini Project Guide

Mr. Jayant Kumar A.Rathod
HOD, CSD

EXTERNAL VIVA

Name of the Examiners	Signature with Date
1. Suritha NV	7/8/24
2. J.A.Rathod	7/8

ABSRACT

The "Volume Controller by Hand Gesture Using OpenCV" project leverages computer vision techniques and Python programming to enable intuitive and touchless control of device volume through hand gestures. The system utilizes OpenCV's robust image processing capabilities to detect, track, and interpret hand movements in real-time. By integrating with audio control APIs, the project enables seamless adjustment of volume based on recognized gestures.

Key features include performance optimization for reliable gesture recognition across different environmental conditions and platforms. The project's iterative development process ensures accuracy and responsiveness in interpreting a variety of hand gestures. Future enhancements aim to further refine gesture recognition using advanced machine learning techniques and enhance user interaction through real-time visual feedback and adaptive environmental adaptation.

Ultimately, the "Volume Controller by Hand Gesture Using OpenCV" project exemplifies the fusion of technology and user-centric design, offering a modern and intuitive interface for enhancing user experience in controlling audio devices.

Beyond technical implementation, the project emphasizes user-centric design principles. It aims to provide a user-friendly interface that enhances accessibility and usability, catering to diverse user preferences and environments. Real-time visual feedback mechanisms and adaptive algorithms further contribute to a seamless user experience, fostering natural interaction with audio devices.

Looking ahead, future enhancements include expanding gesture vocabulary, supporting multi-user environments, and integrating with voice recognition technologies for hybrid control interfaces. These developments aim to further elevate the system's versatility and user satisfaction, positioning it at the forefront of innovative solutions in human-computer interaction.

In summary, the "Volume Controller by Hand Gesture Using OpenCV" project not only showcases the integration of advanced computer vision techniques with practical applications but also sets a precedent for intuitive and efficient control interfaces in modern technology.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI - 590018

Mini Project Report

On

"SOIL ANALYSIS USING COMPUTER VISION AND MACHINE LEARNING"

A report submitted in partial fulfilment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

BHAVISH MK	**4AL21CG012**
DARSHAN RAI	**4AL21CG015**
HARSHITH	**4AL21CG027**
SARVESH ACHARYA	**4AL22CG402**

Under the Guidance of

Dr. Pushparani M K

Senior Assistant Professor

ALVA'S

Education Foundation®

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY MIJAR,

(Unit of Alva's Education Foundation ®, Moodbidri)

Affiliated to Visvesvaraya Technological University, Belagavi,

Approved by AICTE, New Delhi, Recognized by the Government of Karnataka.

Accredited by NAAC with A+ Grade

Shobavana Campus, Mijar, Moodbidri, D.K., Karnataka 2023-2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY MIJAR, MOODBIDRI, D.K. -574225

ALVA'S
Education Foundation®

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the Computer Graphics and Image Processing Laboratory with Mini Project entitled **"SOIL ANALYSIS USING COMPUTER VISION AND MACHINE LEARNING"** has been completed by

BHAVISH MK	4AL21CG012
DARSHAN RAI	4AL21CG015
HARSHITH	4AL21CG027
SARVESH	4AL22CG402

The Bonafide students of the Department of Computer Science and Design, Alva's Institute of Engineering and Technology in the **DEPARTMENT OF COMPUTER SCIENCE AND DESIGN** of the VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini Project report has been approved as it satisfies the academic requirements concerning the Mini Project work of Computer Graphics and Image Processing subject prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

Prof. Jayantkumar A Rathod
HOD, Dept of CSD

EXTERNAL VIVA

Name of the Examiners	Signature with Date
1. Suvitha NV	7/8/24
2. J.A Rathod	

ABSTRACT

Soil analysis is a crucial aspect of agricultural management, influencing crop yield, soil health, and environmental sustainability. Traditional methods of soil analysis are often labor-intensive, time-consuming, and require specialized equipment. This study proposes an innovative approach utilizing computer vision and machine learning to automate and enhance soil analysis. High-resolution digital images of soil samples were captured under controlled conditions, ensuring consistent quality and illumination. These images underwent preprocessing steps such as grayscale conversion, resizing, and noise reduction to standardize and enhance the data for analysis.

Feature extraction was conducted using the Scale-Invariant Feature Transform (SIFT) algorithm, which identified key points and computed descriptors invariant to scale and rotation. The extracted descriptors were clustered using the KMeans algorithm to classify soil textures into categories such as sandy, loamy, and clay. Additionally, the mean pixel intensity of grayscale images was analyzed to estimate soil moisture content, while nutrient deficiencies were detected by identifying yellow regions in the HSV color space.

Soil pH levels were estimated through hue value analysis in the HSV color space, and soil color composition was assessed using mean RGB values. Plant health was evaluated by isolating green pixels in the HSV color space, and weed detection was performed based on specific color ranges. Further analyses included estimating organic matter through brown pixel proportion, assessing soil compaction via edge density from Canny edge detection, and evaluating erosion risk through combined texture and edge analysis.

This multidisciplinary approach demonstrates the potential of computer vision and machine learning in providing efficient, accurate, and scalable solutions for soil analysis. The results indicate that these technologies can significantly enhance the precision of soil property assessments, offering valuable insights for agricultural management and environmental conservation.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI

A CG&IP-LAB MINI PROJECT REPORT ON

Object Detection Using MobileNetSSD

IN

COMPUTER SCIENCE AND DESIGN

By

CHINMAY T N	4AL21CG014
NISHAAN SHETTY	4AL21CG041
YASHU YADAV A	4AL21CG063
ABHISHEK E B	4AL21CG002

Under the Guidance of

Dr. Pushparani MK

Senior Assistant Professor

Dept. of Computer Science and Design

DEPARTMENT OF COMPUTER SCIENCE & DESIGN

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MOODBIDRI-574225, KARNATAKA

2024 – 2025

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR, MOODBIDRI, D.K. -574225

ALVA'S

DEPARTMENT OF COMPUTER SCIENCE & DESIGN

CERTIFICATE

This is to certify that the CG&IP-LAB Mini Project entitled **"Object Detection Using MobileNetSSD "** has been successfully completed by

CHINMAY T	4AL21CG014
NISHAAN SHETT	4AL21CG041
YASHU YADAV	4AL21CG063
ABHISHEK E B	4AL21CG003

the bonafide students of Department of Computer Science & Design, Alva's Institute of Engineering and Technology in **DEPARTMENT OF COMPUTER SCIENCE & DESIGN** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY,BELAGAVI** during the year 2024–2025. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini project report has been approved as it satisfies the academic requirements in respect of Mini Project work prescribed for the Bachelor of Engineering Degree.

Dr.Pushparani MK
Mini Project Guide

Mr. JayantKumar A.Rathod
HOD, CSD

EXTERNAL VIVA

Name of the Examiners	Signature with Date
1. Suritha NV	7/8/24
2. J. A. Rathod	7/8

ABSRACT

Object detection is a pivotal task in computer vision, involving the identification and localization of objects within images. This paper presents an in-depth analysis of the MobileNet Single Shot MultiBox Detector (MobileNetSSD), a cutting-edge framework designed for efficient and real-time object detection on resource-constrained devices like mobile phones and embedded systems.

MobileNetSSD leverages the MobileNet architecture, which employs depthwise separable convolutions to significantly reduce computational complexity and model size while maintaining high accuracy. The MobileNet architecture, combined with the Single Shot MultiBox Detector (SSD) framework, allows for both high-speed and accurate object detection.

This paper provides a detailed exploration of MobileNetSSD's architecture, highlighting key components such as depthwise separable convolutions, which are instrumental in achieving a lightweight model suitable for real-time applications. We also discuss the training process, including data augmentation techniques and optimization strategies that enhance the model's performance.

Experimental results on standard object detection benchmarks, such as the PASCAL VOC and COCO datasets, demonstrate that MobileNetSSD achieves a commendable balance between detection speed and accuracy. The model's performance is evaluated in terms of mean Average Precision (mAP), inference time, and resource consumption, showcasing its potential for deployment in real-world scenarios.

Furthermore, the paper explores various applications of MobileNetSSD, including autonomous driving, surveillance systems, and augmented reality, where real-time processing and low latency are crucial. We also discuss potential improvements and future directions for enhancing MobileNetSSD's capabilities.

In conclusion, MobileNetSSD represents a significant advancement in the field of object detection, offering a practical solution for deploying efficient and accurate detection models on mobile and embedded devices.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI - 590018

Mini Project Report

On

"REAL TIME FACE EMOTION DETECTION SYSTEM USING CNN"

A report submitted in partial fulfilment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

DEEKSHITH ACHARYA	**4AL21CG016**
KARTHIK P NAIK	**4AL21CG032**
PRATHVIRAJ K	**4AL21CG042**
SREE GANESH M S	**4AL21CG056**

Under the Guidance of

Dr. Pushparani M K

Senior Assistant Professor

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY MIJAR,

(Unit of Alva's Education Foundation ®, Moodbidri)

Affiliated to Visvesvaraya Technological University, Belagavi,

Approved by AICTE, New Delhi, Recognized by the Government of Karnataka.

Accredited by NAAC with A+ Grade

Shobavana Campus, Mijar, Moodbidri, D.K., Karnataka 2023-2024

ALVA'SINSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR, MOODBIDRI, D.K. -574225

ALVA'S

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the COMPUTER GRAPHICS AND IMAGE PROCESSING Mini Project entitled "REAL TIME FACE EMOTION DETECTION SYSTEM USING CNN " has been successfully completed by

DEEKSHITH ACHARYA	4AL21CG016
KARTHIK P NAIK	4AL21CG032
PRATHVIRAJ K	4AL21CG042
SREE GANESH M S	4AL21CG056

the Bonafide students of Department Of Computer Science And Design Engineering, Alva's Institute of Engineering and Technology in DEPARTMENT OF COMPUTER SCIENCE AND DESIGN ENGINEERING of the VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the year 2023–24. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini project report has been approved as it satisfies the academic requirements in respect of Mini Project work prescribed for the Bachelor of Engineering Degree.

Dr. Pushpalani M K
Mini Project Guide

Mr.JayantKumar A Rathod
HOD CSD

EXTERNAL VIVA

Name of the Examiners	Signature with Date
1. Savitha NV	8/10/24
2. J. A Rathod	8/10/24

ABSTRACT

This project explores the application of deep learning techniques for facial emotion detection using TensorFlow, Keras, and OpenCV. The project begins with dataset preparation sourced from Kaggle, emphasizing the importance of pre-processing steps such as image resizing and conversion to grayscale to align with the chosen model architecture. TensorFlow and Keras are leveraged for efficient model construction, training, and evaluation, while OpenCV facilitates real-time face detection and emotion recognition.

The implementation includes testing on static images and live webcam feeds, showcasing the model's accuracy in recognizing a range of emotions. By training the model over 100 epochs, significant improvements in accuracy are achieved, validating its potential for practical applications in interactive systems and digital interfaces. The report emphasizes the accessibility of the provided code snippets, designed to guide both beginners and enthusiasts through the process of deploying facial emotion detection systems using deep learning methodologies.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI - 590018

Mini Project Report On

"VERIFICATION OF SIGNATURE"

A mini project report submitted in partial fulfillment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

DEEPASHREE G NAIK	**4AL21CG017**
DHANU SRI R	**4AL21CG019**
ESHWARI K C	**4AL21CG023**
SINDHU N	**4AL21CG055**

Under the Guidance of

Dr. Pushparani M K

Senior Assistant Professor

ALVA'S

Education Foundation

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY MIJAR,

(Unit of Alva's Education Foundation ®, Moodbidri)

Affiliated to Visvesvaraya Technological University, Belagavi,

Approved by AICTE, New Delhi, Recognized by the Government of Karnataka.

Accredited by NACC with A+ Grade

Shobavana Campus, Mijar, Moodbidri, D.K., Karnataka 2023-2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY MIJAR, MOODBIDRI, D.K. -574225

ALVA'S
Education Foundation

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the Computer Graphics and Image Processing Laboratory with Mini Project entitled **"VERIFICATION OF SIGNATURE"** has been completed by

DEEPASHREE G NAIK	4AL21CG017
DHANU SRI R	4AL21CG019
ESHWARI K C	4AL21CG023
SINDHU N	4AL21CG055

The Bonafide students of the Department of Computer Science and Design, Alva's Institute of Engineering and Technology in the **DEPARTMENT OF COMPUTER SCIENCE AND DESIGN** of the VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini Project report has been approved as it satisfies the academic *requirements concerning the Mini Project work of Computer Graphics and Image* Processing subject prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

Prof. Jayanthkumar A Rathod
HOD, Dept of CSD

External Viva

Name of the External	Signature and Date
1. Sunitha NV	7/8/24
2. J. A. Rathod	7/8

ABSTRACT

This project presents a novel Signature Matching system that utilizes deep learning techniques to verify the authenticity of signatures. The system is designed to be user-independent, allowing it to accurately match signatures from various individuals. The core of the system is a fine-tuned ResNet50 constitutional neural network (CNN) model, which is trained on a dataset of signatures to learn distinctive features and patterns. The system's architecture is divided into two stages: signature preprocessing and feature extraction, followed by signature matching and verification.

The system's performance is evaluated using a comprehensive dataset of signatures, and the results dedmonstrate a high accuracy rate in signature verification. The system's user-friendly interface, developed using React.js, allows users to upload or capture signature images, which are then processed and matched using the trained model. The system's robustness and accuracy make it an effective solution for various applications, including forensic science, banking, and law enforcement, where signature verification is a critical aspect of identity authentication. The project's innovative approach and promising results pave the way for further research and development in the field of signature verification and identity authentication.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,
BELAGAVI - 590018

Mini Project Report

On

"IRIS SEGMENTATION"

A report submitted in partial fulfillment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

DHANUSH A S	**4AL21CG020**
KIRAN KUMAR K	**4AL21CG033**
NAKUL N	**4AL21CG038**
GIREESH H	**4AL21CG025**

Under the Guidance of

Dr. Pushparani M K

Senior Assistant Professor

ALVA'S
Education Foundation®

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY MIJAR,

(Unit of Alva's Education Foundation ®, Moodbidri)

Affiliated to Visvesvaraya Technological University, Belagavi,

Approved by AICTE, New Delhi, Recognized by the Government of Karnataka.

Accredited by NACC with A+ Grade

Shobavana Campus, Mijar, Moodbidri, D.K., Karnataka 2023-2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY MIJAR, MOODBIDRI, D.K. -574225

ALVA'S
Education Foundation®

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the Computer Graphics and Image Processing Laboratory with Mini Project entitled **"IRIS SEGMENTATION"** has been completed by

DHANUSH A S	4AL21CG020
KIRAN KUMAR K	4AL21CG033
NAKUL N	4AL21CG038
GIREESH H	4AL21CG025

The Bonafide students of the **Department of Computer Science & Design, Alva's Institute of Engineering and Technology** in **DEPARTMENT OF COMPUTER SCIENCE & DESIGN** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini Project report has been approved as it satisfies the academic requirements concerning the Mini Project work of Computer Graphics and Image Processing subject prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

Prof. Jayantkumar A Rathod
HOD, Dept. of CSD

1] Internal — Jay (J.A.Rathod)
2] External — Sunitha N V 8th 7/8/24

ABSTRACT

This mini-project explores the practical implementation of computer vision techniques for real-time iris detection and segmentation. Leveraging MediaPipe's FaceMesh model and OpenCV, the project demonstrates a robust framework capable of detecting and highlighting irises in live webcam feeds.

The FaceMesh model is employed to accurately locate facial landmarks, including the positions of the left and right irises. Utilizing OpenCV's image processing capabilities, the project calculates and visualizes the irises by drawing minimum enclosing circles around the detected landmarks. This approach ensures real-time performance, essential for applications requiring immediate feedback.

The project not only showcases the technical integration of these tools but also lays the groundwork for future advancements in gaze tracking, facial expression analysis, and broader facial recognition applications. By providing a foundational understanding of facial landmark detection models, the project illustrates their potential to enhance human-computer interaction and facilitate innovative applications across various domains, including healthcare, education, and security.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI - 590018

Mini Project Report

On

"REAL TIME COLOR DETECTION AND RECOGNITION SYSTEM"

A report submitted in partial fulfilment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

DHANUSH SHENOY	**4AL21CG021**
DHEERAJ SHETTY	**4AL21CG022**
KARTHIK	**4AL21CG031**
RANJEETH P JAIN	**4AL21CG046**

Under the Guidance of

Dr. Pushparani M K

Senior Assistant Professor

ALVA'S

Education Foundation

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY MIJAR,

(Unit of Alva's Education Foundation ®, Moodbidri)

Affiliated to Visvesvaraya Technological University, Belagavi,

Approved by AICTE, New Delhi, Recognized by the Government of Karnataka.

Accredited by NAAC with A+ Grade

Shobavana Campus, Mijar, Moodbidri, D.K., Karnataka 2023-2024

ALVA'SINSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR, MOODBIDRI, D.K. -574225

ALVA'S

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the COMPUTER GRAPHICS AND IMAGE PROCESSING Mini Project entitled **"REAL TIME COLOR DETECTION AND RECOGNITION SYSTEM"** has been successfully completed by

DHANUSHSHENOY	**4AL21CG021**
DHEERAJSHETTY	**4AL21CG022**
KARTHIK	**4AL21CG031**
RANJEETHPJAIN	**4AL21CG046**

the Bonafide students of Department Of Computer Science And Design Engineering, Alva's Institute of Engineering and Technology in DEPARTMENT OF COMPUTER SCIENCE AND DESIGN ENGINEERING of the VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the year 2023–24. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini project report has been approved as it satisfies the academic requirements in respect of Mini Project work prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

Mr.JayantKumar A Rathod
HOD CSD

EXTERNAL VIVA

Name of the Examiners	Signature with Date
1. Sunitha N V	7/8/24
2. J. A Rathod	7/8

ABSTRACT

This project presents a color detection and recognition system that utilizes computer vision and text-to-speech (TTS) technology to identify and articulate colors in real-time. Using a webcam as the primary input device, the system captures video frames and processes them to detect the color at a user-specified point through a double-click interaction. The detected color is matched against a predefined list of color names and their RGB values stored in a CSV file. The most closely matching color name is then retrieved and verbally communicated using a TTS engine. The system also provides visual feedback by overlaying a semi-transparent rectangle on the video frame with the detected color and its corresponding name and RGB values. This information is dynamically displayed within a fixed interval to ensure accurate and timely updates.

In addition to color detection, the project features a user-friendly interface with enhanced visual elements. The interface includes a function to draw rounded rectangles around the detected color information, creating a polished and professional appearance. The system also ensures the rectangle and text are visible and appropriately positioned within the frame, adapting to various lighting conditions and color intensities. By integrating real-time processing, threading for efficient color detection, and adjustable frame rate settings, the project achieves a balance between performance and user experience. This color detection and recognition system demonstrates the practical application of computer vision and TTS technologies in creating interactive and accessible tools for various use cases, including educational purposes and assistance for visually impaired individuals.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

A CGIP PROJECT REPORT ON

Image Compression and B&W Conversion

IN

COMPUTER SCIENCE AND DESIGN

By

H M TUSHAR	4AL21CG026
HEMANT MUNAVALLI	4AL21CG028
RAKSHA SIDDESH G	4AL21CG044
SHREYA L	4AL21CG054

Under the Guidance of

Dr. Pushparani M K

Senior Associate Professor

ALVA'S

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MOODBIDRI-574225, KARNATAKA

2023 – 2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR, MOODBIDRI, D.K. -574225

ALVA'S

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the DBMS Mini Project entitled **"IMAGE COMPRESSION AND B&W CONVERSION"** has been successfully completed by

H M TUSHAR	4AL21CG026
HEMANT MUNAVALLI	4AL21CG028
RAKSHA SIDDESH G	4AL21CG044
SHREEYA L	4AL21CG054

the bonafide students of **Department of Computer Science & Design, Alva's Institute of Engineering and Technology** in **DEPARTMENT OF COMPUTER SCIENCE & DESIGN** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY,BELAGAVI** during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini project report has been approved as it satisfies the academic requirements in respect of Mini Project work prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

Mr. JayanthKumar A. Rathod
HOD CSD

EXTERNAL VIVA

Name of the Examiners	Signature with Date
1. Suritha NV	7/8/24
2. J. A. Rathod	7/8

ABSTRACT

In the digital age, high-resolution images are integral to fields like social media, professional documentation, and academic research. However, the large storage space and high bandwidth required for these images present challenges in efficient data management and transmission. This project addresses these issues by developing a Python-based tool offering both image compression and black-and-white conversion using OpenCV. This tool reduces file sizes while maintaining image quality, making it highly beneficial for diverse applications.

Image compression minimizes storage and transmission requirements without significantly affecting quality. By using advanced compression algorithms with OpenCV, this project ensures that images retain essential details while significantly reducing size. This is particularly valuable for applications with large datasets or requiring rapid image transmission, such as online platforms and cloud storage solutions. The compression process can be customized to balance between image quality and compression level, catering to specific user needs.

Black-and-white conversion simplifies image data representation and enhances processing efficiency. This feature is useful for tasks like optical character recognition (OCR), image segmentation, and object detection, where color information is often redundant. By converting images to grayscale and applying binary thresholding techniques, the tool streamlines image processing workflows and reduces computational overhead. Combining these functionalities within a single tool provides a comprehensive solution for various image processing needs.

The developed tool offers a user-friendly interface and supports multiple image formats, ensuring broad applicability and ease of use. Users can choose between compression, black-and-white conversion, or both, based on their requirements. The project demonstrates the effectiveness of combining these processes, showcasing improvements in storage efficiency and processing speed. This approach enhances image management capabilities and contributes to advancing image processing technologies, making it valuable for developers, digital archivists, and researchers

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI - 590018

Mini Project Report

On

"DETECTION OF FRACTURE IN HAND USING IMAGE PROCESSING"

A report submitted in partial fulfillment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

MANOJ M **4AL21CG036**

Under the Guidance of

Dr. Pushparani M K

SeniorAssistant Professor

ALVA'S
Education Foundation®

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY MIJAR,

(Unit of Alva's Education Foundation ®, Moodbidri)

Affiliated to Visvesvaraya Technological University, Belagavi,

Approved by AICTE, New Delhi, Recognized by the Government of Karnataka.

Accredited by NACC with A+ Grade

Shobavana Campus, Mijar, Moodbidri, D.K., Karnataka 2023-2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY MIJAR, MOODBIDRI, D.K. -574225

ALVA'S
Education Foundation®

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the Computer Graphics and Image Processing Laboratory with Mini Project entitled **"DETECTION OF FRACTURE IN HAND USING IMAGE PROCESSING"** has been completed by

MANOJ M 4AL21CG036

The Bonafide student of the **Department of Computer Science & Design, Alva's Institute of Engineering and Technology** in **DEPARTMENT OF COMPUTER SCIENCE & DESIGN** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini Project report has been approved as it satisfies the academic requirements concerning the Mini Project work of Computer Graphics and Image Processing subject prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K	**External Faculty**	**Prof. Jayantkumar A Rathod**
Mini Project Guide		HOD, CSD Dept.

1) Internal : J.A. Rathod

2) External : Suritha NV 8/8/24

ABSTRACT

The detection of fractures in hand X-ray images is a critical task in the medical field, often requiring expert radiologists to perform detailed analyses. This project aims to develop an automated system for detecting fractures using image processing techniques and machine learning algorithms. The proposed system enhances X-ray images, extracts relevant features, and applies machine learning models to identify potential fractures. By automating the detection process, the system assists medical professionals in making quicker and more accurate diagnoses, ultimately improving patient outcomes.

The implementation leverages Python programming along with libraries such as OpenCV, PIL, and TensorFlow. The system architecture includes components for image acquisition, pre-processing, feature extraction, fracture detection, and result visualization. Techniques such as histogram equalization, noise reduction, edge detection, and image segmentation are employed to process the images effectively.

The project demonstrates high accuracy in detecting fractures when tested with a dataset of hand X-ray images, showing significant potential for reducing diagnostic time and improving consistency. Future enhancements could include integration with hospital information systems, expansion to other types of fractures, and the application of advanced deep learning techniques to further improve detection performance.

In conclusion, this project provides a robust and efficient solution for fracture detection in hand X-ray images, showcasing the power of image processing and machine learning in medical diagnostics.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI-590018

Mini Project Report On

"KIDNEY STONE DETECTION AND LENGTH MEASUREMENT"

A report submitted in partial fulfillment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

NAYANA S M	4AL21CG040
LIKHITH L	4AL21CG035

Under the Guidance of

Dr. Pushparani M K

Senior Assistant Professor

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MOODBIDRI-574225, KARNATAKA

2023 – 2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR, MOODBIDRI, D.K. -574225

ALVA'S
Education Foundation®

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the CGIP Mini Project entitled **"KIDNEY STONE DETECTION AND LENGTH MEASUREMENT"** has been successfullycompleted by

NAYANA S M	4AL21CG040
LIKHITH L	4AL21CG035

the bonafede students of **Department of Computer Science & Design, Alva's Institute of Engineering and Technology** in **DEPARTMENT OF COMPUTER SCIENCE & DESIGN** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini project report has been approved as it satisfies the academic requirements in respect of Mini Project work prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

Mr. JayanthKumar A. Rathod
HOD CSD

EXTERNAL VIVA

Name of the Examiners	Signature with Date
1. Suritha NV	8/8/24
2. J. A. Rathod	

ABSTRACT

Kidney stones represent a prevalent and serious health issue requiring precise diagnostic tools for effective management. This project introduces an innovative image processing framework implemented in MATLAB for automated detection and accurate measurement of kidney stones. The system employs advanced techniques such as image preprocessing, segmentation, and morphological operations to isolate stones from medical images. Pixel calibration ensures measurements are translated into real-world millimetres, essential for clinical assessments. A user-friendly graphical interface facilitates intuitive image uploading, processing, and visualization of diagnostic results.

Machine learning algorithms enhance detection accuracy by adapting to varying stone characteristics encountered in patient data. The integration of these technologies aims to streamline diagnostic workflows, optimize treatment planning, and ultimately improve patient outcomes in nephrology practice. By automating these critical tasks, the system not only enhances diagnostic precision but also reduces human error and accelerates the decision-making process in clinical settings.

This research contributes to advancing medical imaging technologies, paving the way for more efficient and accurate kidney stone diagnosis and treatment. The project's outcomes promise to significantly benefit healthcare professionals by providing reliable tools to enhance clinical efficiency and patient care.

VISVESVARAYATECHNOLOGICAL UNIVERSITY,

BELAGAVI - 590018

Mini Project Report

On

"DETECTION OF SKIN DISEASE USING DEEP LEARNING"

A report submitted in partial fulfillment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

DEVADIGA ROSHNI NARAYAN	**4AL21CG018**
RIDHI R HEGDE	**4AL21CG047**
SANDHYA MOOLYA	**4AL21CG048**
CHETHAN	**4AL22CG401**

Under the Guidance of

Dr. Pushparani M K

Senior Assistant Professor

ALVA'S

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY MIJAR,

(Unit of Alva's Education Foundation ®, Moodbidri)

Affiliated to Visvesvaraya Technological University, Belagavi,

Approved by AICTE, New Delhi, Recognized by the Government of Karnataka.

Accredited by NACC with A+ Grade

Shobavana Campus, Mijar, Moodbidri, D.K., Karnataka 2023-2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGYMIJAR, MOODBIDRI, D.K. -574225

ALVA'S
Education Foundation

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the Computer Graphics and Image Processing Laboratory with Mini Project entitled **"DETECTION OF SKIN DISEASE USING DEEP LEARNING"** has been completed by

DEVADIGA ROSHNI NARAYAN	4AL21CG018
RIDHI R HEGDE	4AL21CG047
SANDHYA MOOLYA	4AL21CG048
CHETHAN	4AL22CG401

The Bonafidestudents of the Department of Computer Science and Design, Alva's Institute of Engineering and Technology in the **DEPARTMENT OF COMPUTER SCIENCE AND DESIGN** of the VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini Project report has been approved as it satisfies the academic requirements concerning the Mini Project work of Computer Graphics and Image Processing subject prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

Prof. Jayan Kumar A Rathod
HOD, Dept of CSD

External viva

Name of the Examiner	Date and Signature
1. J.A Rathod - Jay	7/8/24
2. Suvitha NV	7/8/24

ABSTRACT

This prototype web application uses computer vision to assist in the early detection of various skin lesions, including potentially cancerous ones. Leveraging a Deep Learning model implemented with Tensorflow.js, the app analyzes images in jpg or png formats directly on the user's device, ensuring privacy and rapid results. It can identify multiple types of skin lesions, such as melanocytic nevi, melanoma, benign keratosis, basal cell carcinoma, actinic keratoses, vascular lesions, and dermatofibroma. Despite its capabilities, the model is not yet accurate enough for real-life medical use, as it often fails to consistently assign the highest probability to the correct lesion. Additionally, the model's performance can be affected by the quality of images, particularly those taken with mobile phones, since it was not trained on such photos.

For the tool to become more reliable, three key improvements are necessary: collaboration with dermatologists or pathologists, access to more high-quality labeled training data, and extensive field testing. These steps would help validate the model's predictions, enhance its robustness, and ensure its performance under real-world conditions. The project emphasizes data privacy by processing images locally on the user's device, avoiding external server interactions. The development process and test results are documented on Kaggle, and the source code is available on GitHub under an open-source license. While promising, the application requires further refinement and validation to be a trustworthy diagnostic tool in clinical settings.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI - 590018

Mini Project Report

On

"DETECTION OF FRACTURE IN HAND USING IMAGE PROCESSING"

A report submitted in partial fulfillment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

SHARVARI M S **4AL21CG049**

Under the Guidance of

Dr. Pushparani M K

SeniorAssistant Professor

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY MIJAR,

(Unit of Alva's Education Foundation ®, Moodbidri)

Affiliated to Visvesvaraya Technological University, Belagavi,

Approved by AICTE, New Delhi, Recognized by the Government of Karnataka.

Accredited by NACC with A+ Grade

Shobavana Campus, Mijar, Moodbidri, D.K., Karnataka 2023-2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY MIJAR, MOODBIDRI, D.K. -574225

ALVA'S
Education Foundation

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the Computer Graphics and Image Processing Laboratory with Mini Project entitled **"DETECTION OF FRACTURE IN HAND USING IMAGE PROCESSING"** has been completed by

SHARVARI M S 4AL21CG049

The Bonafide student of the **Department of Computer Science & Design, Alva's Institute of Engineering and Technology** in **DEPARTMENT OF COMPUTER SCIENCE & DESIGN** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini Project report has been approved as it satisfies the academic requirements concerning the Mini Project work of Computer Graphics and Image Processing subject prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

External Faculty

Prof. Jayantkumar A Rathod
HOD, CSD Dept.

1) Internal : J. A. Rathod
2) External : Sunitha N V

8/8/24

ABSTRACT

The detection of fractures in hand X-ray images is a critical task in the medical field, often requiring expert radiologists to perform detailed analyses. This project aims to develop an automated system for detecting fractures using image processing techniques and machine learning algorithms. The proposed system enhances X-ray images, extracts relevant features, and applies machine learning models to identify potential fractures. By automating the detection process, the system assists medical professionals in making quicker and more accurate diagnoses, ultimately improving patient outcomes.

The implementation leverages Python programming along with libraries such as OpenCV, PIL, and TensorFlow. The system architecture includes components for image acquisition, pre-processing, feature extraction, fracture detection, and result visualization. Techniques such as histogram equalization, noise reduction, edge detection, and image segmentation are employed to process the images effectively.

The project demonstrates high accuracy in detecting fractures when tested with a dataset of hand X-ray images, showing significant potential for reducing diagnostic time and improving consistency. Future enhancements could include integration with hospital information systems, expansion to other types of fractures, and the application of advanced deep learning techniques to further improve detection performance.

In conclusion, this project provides a robust and efficient solution for fracture detection in hand X-ray images, showcasing the power of image processing and machine learning in medical diagnostics.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI

MINI PROJECT REPORT
ON

"DETECTION OF DROWSY DRIVER IN REAL-TIME"

A report submitted in partial fulfilment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY

IN

COMPUTER SCIENCE AND DESIGN ENGINEERING

Submitted By

SHIBANI	4AL21CG051
SHIVANI	4AL21CG052
SHRAVYA	4AL21CG053
SURAKSHA	4AL21CG059

Under the Guidance of

Dr. Pushparani M K

Senior Assistant Professor

ALVA'S

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MOODBIDRI-574225, KARNATAKA

2023– 2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR, MOODBIDRI, D.K. -574225

ALVA'S

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the COMPUTER GRAPHICS AND IMAGE PROCESSING Mini Project entitled **"DETECTION OF DROWSY DRIVER IN REAL TIME"** has been successfully completed by

SHIBANI	**4AL21CG051**
SHIVANI	**4AL21CG052**
SHRAVYA	**4AL21CG053**
SURAKSHA	**4AL21CG059**

the Bonafide students of **Department Of Computer Science And Design Engineering, Alva's Institute of Engineering and Technology** in **DEPARTMENT OF COMPUTER SCIENCE AND DESIGN ENGINEERING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023–24. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini project report has been approved as it satisfies the academic requirements in respect of Mini Project work prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

Mr. JayantKumar A. Rathod
HOD CSD

EXTERNAL VIVA

Name of the Examiners	Signature with Date
1. Swetha N V	8/9/24
2. J-A-Rathod	

ABSTRACT

This project presents a real-time system designed to monitor driver alertness by detecting blinks and signs of drowsiness. Utilizing video feed from a camera, the system processes images in real-time, applying histogram equalization for improved feature detection under various lighting conditions. Facial landmarks, particularly around the eyes, are identified and analyzed to monitor blink patterns and eye closure, critical indicators of drowsiness. When abnormal blink patterns or prolonged eye closures are detected, the system triggers both visual and audible alerts to notify the driver, thereby enhancing road safety by preventing accidents caused by driver fatigue. The system is user-interactive, allowing the driver to reset or exit the application via simple key presses, and includes robust error handling to ensure reliability. Future enhancements could involve advanced image processing techniques, multi-sensor integration, and a user-friendly interface with better feedback mechanisms. Extensive real-world testing and customization based on individual driver behaviors will further improve accuracy and reliability. This project demonstrates a practical and effective approach to improving road safety, with significant potential to reduce accidents caused by driver drowsiness through continuous system enhancements and integration with other in-vehicle technologies.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI - 590018

Mini Project Report

On

"Enhancing Visual Data Through Advanced Image Processing Techniques Using OpenCV"

A report submitted in partial fulfillment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

SUJAYKUMAR B ADOOR	4AL21CG057
VINITH KALIKAR	4AL21CG062
CHANDAN KUMAR M	4AL21CG013
SURAJ	4AL21CG058

Under the Guidance of

Dr. Pushparani M K

Senior Assistant Professor

ALVA'S
Education Foundation®

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY MIJAR,

(Unit of Alva's Education Foundation ®, Moodbidri)

Affiliated to Visvesvaraya Technological University, Belagavi,

Approved by AICTE, New Delhi, Recognized by the Government of Karnataka.

Accredited by NACC with A+ Grade

Shobavana Campus, Mijar, Moodbidri, D.K., Karnataka 2023-2024

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY MIJAR, MOODBIDRI, D.K. -574225

ALVA'S
Education Foundation®

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

CERTIFICATE

This is to certify that the Computer Graphics and Image Processing Laboratory with Mini Project entitled **"Enhancing Visual Data Through Advanced Image Processing Techniques Using OpenCV"** has been completed by

SUJAYKUMAR B ADOOR	4AL21CG057
VINITH KALIKAR	4AL21CG062
CHANDAN KUMAR M	4AL21CG013
SURAJ	4AL21CG058

The Bonafide students of the **Department of Computer Science & Design, Alva's Institute of Engineering and Technology** in **DEPARTMENT OF COMPUTER SCIENCE & DESIGN** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini Project report has been approved as it satisfies the academic requirements concerning the Mini Project work of Computer Graphics and Image Processing subject prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

Prof. Jayantkumar A Rathod
HOD, Dept. of CSD

Examiners
1) Internal - J.A Rathod - Jay
2) Suritha NV

2] External - Suritha NV SNV
7/9/24

ABSTRACT

Image processing is a pivotal field within computer science and engineering that focuses on the manipulation and analysis of visual data to enhance image quality, extract meaningful information, or transform images for various applications. This project aims to demonstrate the practical implementation of several fundamental image processing techniques using OpenCV, an open-source computer vision and machine learning library. By converting images into pencil sketches, performing morphological operations, creating negative images, converting to grayscale, and applying cartoon effects, the project showcases the versatility and power of OpenCV in transforming visual data. Through a structured methodology encompassing requirement analysis, literature review, algorithm design, implementation, testing, and validation, this project highlights how these techniques can be applied effectively across diverse domains such as healthcare, security, automotive, retail, robotics, and entertainment. The project also emphasizes the importance of a user-friendly interface to facilitate interaction with the image processing functions. Overall, this project underscores the critical role of image processing in modern digital technology, providing a comprehensive understanding of essential techniques and their practical applications, with potential for future enhancements through advanced machine learning models and real-time optimization.